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Decisions in human centric multiagent systems: dealing with softness and bipolarity in judgments, intentions and evaluations

Janusz Kacprzyk*

Systems Research Institute, Polish Academy of Sciences
ul. Newelska 6, 01-447 Warsaw, Poland
Fellow of IEEE, IFSA, EurAI/ECCAI, SMIA
Full Member, Polish Academy of Sciences
Member, Academia Europaea
Member, European Academy of Sciences and Arts
Foreign Member, Bulgarian Academy of Sciences
Foreign Member, Spanish Royal Academy of Economic and Financial Sciences (RACEF)

Abstract

We are concerned with some big challenges facing IT/ICT for a long time which can be briefly stated as those related to making computers to be "cognitive partners" for humans. We concentrate on decision making which is a ``meta-problem" that is omnipresent in virtually all human activities. Since decisions are made by humans, and for the humans, even if mimicked by/in inanimate systems, then the decision making is a clear human centric/centered problem, in the sense of e.g. Dertouzos, Pedrycz, etc.

In the formal setting, decision making boils down to finding a best decision, usually using some choice or optimization tools. However, in real world situations, we should add some “soft” elements to our models to make them more human consistent, hence easier implementable, exemplified by judgments, attitudes and intentions. Obviously, the realistic models should involve multiple agents (decision makers), multiple criteria and dynamics. We should have tools to deal with uncertain and imprecise (fuzzy) preferences and utilities, bipolar assessments by “pro” and “con” arguments and conditions, tools for expressing coordination, cooperation and collaboration, as well as a full range of general attitudes: from greed to fairness, maybe even to the altruism.

We will assume first that we operate in the context of show how to formalize and solve problems in which there is a bipolarity in the decision maker’s intentions and preferences which is basically related to the inclusion in real human judgments what is good and bad, i.e. pros and cons, what is necessary and optional, what should result in rejection and acceptance, etc. We will show how

E-mail address: kacprzyk@ibspan.waw.pl

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elements of affective computing can be of use, and also how elements of some approaches to such a broadly perceived bipolar decision making setting can be devised, from various points of view, notably non-orthodox multicriteria decision making, database querying, intention modeling, a BDI (belief-desire-intention) multiagent system architectures, etc., notably in the settings proposed by Kacprzyk and Zadrozny. We will also mention some relations to Wang's cognitive informatics, and Aliev's Z-number based general approach to dealing with systems analytic and decision making problems.

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